

REMARKS

Claims 1-21, 23-31 and 33-42 are pending in the application. Claims 1-19, 24, 26-31 and 39-42 have been previously withdrawn from consideration. Claims 20, 21, 23, 25 and 33-38 stand rejected to by the Examiner. The drawings have been accepted by the Office. The Examiner's objections and rejections are addressed below in substantially the same order as in the office action.

For conciseness, Applicant has only addressed the matters not previously raised by the Examiner in this case. Applicant incorporates the substance of the prior papers filed in this case with regards to the various rejections of the pending claims.

Claim Rejections Under 35 U.S.C. § 112

Claim 20 stand rejected under 35 U.S.C. 112, first paragraph, because the Examiner contends that the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention *commensurate in scope* with these claims.

Applicant submits that the Examiner's application of Section 112 contravenes established Federal Circuit law. The Federal Circuit in *Falkner v. Inglis* (2006) held that the written description requirement requires that a patent's specification show "possession" of the claimed invention and that examples are not necessary to support the adequacy of a written description. 448 F.3d 1357 (fed. Cir. 2006). The Court cited to *LizardTech, Inc. v. Earth Resource Mapping, PTY, Inc.*:

'A claim will not be invalidated on section 112 grounds simply because the embodiments of the specification do not contain examples explicitly covering the full scope of the claim language. That is because the patent specification is written for a person of skill in the art, and such a person comes to the patent with the knowledge of what has come before. Placed in that context, it is unnecessary to spell out every detail of the invention in the specification; only enough must be included to convince a person of skill in the art that the inventor possessed the invention and to enable such a person to make and use the invention without undue experimentation.' 424 F.3d 1336, 1345 (Fed. Cir. 2005) (citing *Union Oil*

Co. v. Atl. Richfield Co., 208 F.3d 989, 997 (Fed. Cir. 2000) ; In re GPAC Inc., 57 F.3d 1573, 1579 (Fed. Cir. 1995)) .

In Applicants view, the metal cap shown is merely illustrative of a structure suitable for the purposes discussed in the specification. Shaped charge technology has been available for decades. The technology and devices for forming perforating jets, Applicants believe, is sufficiently developed that one of ordinary skill in the art would instantly recognize the function performed by the metal cap and multitude of structures that would perform that function.

Claims 20, 21, 23, 25, 33-38 and 43-46 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 20, the Examiner contends that it is unclear whether the substantially particulated portion of the jet comprises particles of molten material (liquid state) or particles of non-molten material (solid particles). It is the Applicant's position that the claim merely requires a substantially particulated portion of the jet having a lower density than a forward portion of the jet. The term "molten" material is referred to by the Applicant only in the background, not in connection with the present disclosure. Applicant submits that the Examiner is improperly importing and applying terminology from cited references to the present claims

Claim 21 has been revised to state that particulated portion is formed by a filler material.

Claim 20, 21, 23, 25 and 34-38 stand rejected as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 21 72.01.

Applicant observes that the base claims recite a liner. Shaped charges have been in existence for decades. As noted previously, Applicant's position is that those of ordinary skill in the art of ballistics can, based on the Applicant's disclosure, readily devise a liner having the claimed features.

Claims 43-46 have been cancelled.

Claim Rejections Under 35 U.S.C. § 102

Claims 20, 21, 23, 25, 33-38 and 43-46 stand rejected under 35 U.S.C. 102(a & e) as being clearly anticipated by Liu (US 200310037692 Al). Claims 43-46 have been cancelled. The Examiner contends that it is “inherent to Liu that the less dense portion of the jet formed from the aluminum powder is not formed as a completely solid non-particulated jet of molten material, but instead comprises a substantially particulated jet of molten material. Note that the applicants' are not claiming a specific particulate size for the particles of the particulated portion of the jet, or whether the jet comprises a particulated jet of molten material (liquid state) or a particulated jet of non-molten solid material.”

Applicant requests the Examiner to clarify why it is inherent in Liu that the jet is a substantially particulated jet of molten material. Applicant submits that the Examiner has improperly substituted the clear teaching in Liu of a substantially, if not completely, molten jet—with a substantially particulated jet of molten material. Thus, claim 20 and all claims depending therefrom are in condition for allowance.

Claim Rejections Under 35 U.S.C. § 103

Claims 20, 21, 23, 25, 33-38 and 43-46 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Powell (US 6,786,157 B1) in view of Liu (US 200310037692Al). Claims 43-46 have been cancelled.

To complete the record, Applicant reproduces the arguments previously made:

Applicant again requests the Examiner technical justification for the assertion that increasing the depth of penetration would enhance cutting properties. As the art is understood by the Applicant, penetrating a through wall of a drill pipe is of little concern in the well completion context. However, a wide dispersion blast to ensure that a pipe has been severed throughout a full three-hundred sixty degree arc is of

foreseeable concern in order to extract a well tubular. Thus, Applicant re-iterates that one skilled in the art has no motivation to modify Powell with Liu.

To complete the record, Applicant reproduces the arguments previously made: Applicant respectfully submits that the Examiner has used the Applicant's application as a blueprint to combine the contrary teachings of Powell and Liu. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). MPEP 2143.

In this instance, the prior art clearly does not have a suggestion or motivation to combine. Section 2143.01 of the MPEP defines two cases that preclude a finding of a suggestion to combine: (i) a modification that would change the principle of operation, and (ii) a modification that renders a device unsatisfactory for its intended purpose. For the reasons presented below, the Examiner's proposed modification falls within these two cases.

1. MPEP 2143.01 VI. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)

The principles of operation of the Powell Device and the Liu Device are distinct and incompatible. Modifying the Powell Device with the metal cap of the Liu Device would clearly change the principle of operation of the Powell Device. The key

operational principle of the Powell Device is the dispersion of energy using particulate material:

Accordingly, the present invention provides a hollow charge explosive device including an explosive charge defining boundary walls of a cavity and including **particulate material** located forward of said boundary walls **so as to be dispersible by said explosive charge when detonated**. (Col. 2, lines 34-38)

The particulate material, if present in a liner, is driven in the same way as that of a conventional shaped charge liner. **However, in this case, the particulate medium forms into a highly energetic non-cohesive stream of particles, generally wider than that produced by a conventionally lined shaped charge**. In this highly energised state, the low bulk density of the liner material and high surface area attributable to each particle of the liner material, together with the larger surface area of the jets cross section, facilitates an intimate and violent kinetically stimulated reaction with the target medium. Given a knowledge of the intended target material and its constitution, eg a snow slab, the liner material can be chosen to optimise the blast energy yield over and above that normally attributable to the explosive charge alone. (Col. 2, lines 42-55)(emphasis added)

Furthermore, Powell describes the advantages of his invention with respect to the volume of snow removed, not the depth of the crater created by the charge. In particular, Powell explains that significantly greater volume of the craters in Figures 4 and 5 as compared with Figure 3. Powell does not in any way suggest that the depth of penetration would improve the operation of the device. In fact, Figures 6-9 suggest quite the contrary. Powell shows all four embodiments either above or at the surface of the snow. The principle behind the Powell device is based on a wide-dispersion near surface detonation, which is contrary to the deep penetration features of Liu.

The Examiner correctly points out that Powell does suggest a downhole hole application for its device. However, as Applicant discussed in the prior filing, the downhole application was for “cutting” wellbore tubulars (“rapid internal cutting of narrow bore, thick walled pipes, typical of well liners and drilling shafts”). Given the ample context Powell gives, it is clearly that Powell intends the wide dispersive

energy blast to cut the pipe. This is often done to remove pipe from a wellbore and the wide energy blast would be advantageous to sever the pipe. However, the principle of operation of Liu is to generate a concentrated jet driven by sufficient energy to deeply penetrate a formation surrounding a pipe, while forming a small perforation that otherwise leaves the pipe intact. The diametrically opposite principles of operation of these references preclude a finding of prima facie obviousness because the Examiner's proposed modification or combination of Powell and Liu would necessarily change the principle of operation of Powell, even in downhole applications.

In connection with this issue, Applicant has submitted the affidavit of one skilled in the art in support of the Applicant's contention that the pipe cutting aspects of Powell have no meaningful relationship with the operation and use of shaped charges.

2. MPEP 2143.01 (v) If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)

The Examiner contends that "enhanced penetrative properties" would motivate one skilled in the art to combine a metal cap layer with the Powell liner for downhole applications. Providing the Powell liner with "enhanced penetrative properties," however, would make the Powell device unsatisfactory for its stated applications for "cutting of narrow bore, thick walled pipes." The Examiner has yet to explain how enhancing penetration benefits the cutting of pipes. Enhanced penetration would, as Powell repeatedly explains in various instances, direct the focus of the energy stream away from the area of interest. In this case, the enhanced penetration would direct the energy blast into a formation surrounding the wellbore pipe. In contrast, a wide dispersion shallow blast would impact the perimeter of the pipe to be cut. Thus, cutting pipe requires a severing of a circumference of the pipe, not merely perforating a section of the pipe. Accordingly, one skilled in the art would not combine the metal

cap with the Powell liner because the Powell device would be rendered unsatisfactory for its intended purpose of cutting pipe.

Other Discussion in Powell that Teaches Away from the Combination

Applicant further observes that the applications Powell suggests for the present teaching do not utilize enhanced penetration:

Although the use of present invention has been described in terms of avalanche control applications, the benefits of controlled and highly directional cutting, perforation or stimulation of secondary reactions of explosive devices according to the present invention has a wide range of other potential applications. These include:

rapid generation of **wide access holes** in concrete/rock walls in support of rescue and recovery operations, where a range of liner materials and particle sizes for the liner can be chosen to control the nature of the cut and/or residual particle penetration into sensitive areas behind;

the use of directing the **highly focused blast effects** to combat and extinguishing burning oil wells;

rapid internal **cutting of narrow bore, thick walled pipes**, typical of well liners and drilling shafts; and

spalling of loose rock from chamber roofs in underground mines, civil tunnelling and mining operations and underwater engineering operations. (Col. 8, Lines 13-30)(emphasis added).

“Enhanced penetration” plays no role, to Applicant’s knowledge, in any of the above applications. Rather, each of the above applications involve surface or near surface activity. Applicant further observes that Powell specifically states that his device is for “**cutting**” well liners and drilling shafts—not perforating well liners. Indeed, as one skilled in the art would appreciate, a perforating activities that cuts a well liner is highly undesirable since the overall wellbore structure can be weakened and compromised. In connection with this issue, Applicant has submitted the

affidavit of one skilled in the art is support of the Applicant's contention that the maintaining integrity of a pipe is a design consideration for shaped charges and the lack of integrity may lead to collapse of a wellbore.

CONCLUSION

For all the foregoing reasons, Applicant submits that the application is in a condition for allowance and such action is requested. The Commissioner is authorized to charge any fees deemed necessary or credit any overpayment related to the filing of this Response to Deposit Account No. **13-0010 (COR-1075-US)**.

Respectfully submitted,

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